A Spectroscopic Study of the Solar Corona from Norikura and SOHO data

K.P. Raju et al.

Indian Institute of Astrophysics, India

Co-authors: T. Sakurai/NAOJ, Japan, K.Ichimoto/NAOJ, Japan We report the results from a spectroscopic study of the solar corona, wherein, we examine some of the current problems in the corona, such as the plume-interplume differences in coronal holes, coronal loops in active regions and wave propagation in the corona. The distribution of emission line intensities, Doppler velocities and line widths in the corona were obtained from the spectroscopic observations made in the coronal emission lines from Norikura Coronagraph. The coronal images in Fe IX,X 171 Å and Fe XII 195 Å from SOHO EIT were used to get the temperature map of the corona. Combining both, the nonthermal velocities in the coronal region are obtained without the usual assumption of a uniform ion temperature. Following results are obtained from the study. (1) The Doppler velocities show excess blue-shifts over red-shifts in coronal holes with differences in plume-interplume regions. (2) The nonthermal velocities show a pronounced difference between the coronal hole and closed-field regions which points to the important role of nonthermal broadening mechanism in the acceleration of fast solar wind. (3) The nonthermal velocities are larger by about 20 % at the interplume regions as compared to plumes. This supports the view that the interplume regions are the source regions of the fast solar wind. (4) The preliminary analysis of the time sequence data shows signatures of wave propagation in the corona.